UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,778	03/07/2002	Mohamed El-Sherbeini	20194P	9665

210 7590 05/14/2004

MERCK AND CO INC
P O BOX 2000
RAHWAY, NJ 070650907

EXAMINER	
KERR, KATHLEEN M	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/070,778	EL-SHERBEINI ET AL.	
	Examiner	Art Unit	
	Kathleen M Kerr	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 15-17* is/are pending in the application.

4a) Of the above claim(s) *9-11 and 15-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-8* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: *alignment*.

DETAILED ACTION

Application Status

1. In response to the previous Office action, a written restriction requirement (mailed on January 29, 2004), Applicants filed a response and amendment received on March 1, 2004. Said amendment amended Claims 1, 9, and 15. As noted by Applicants, Claims 12-14 had been previously cancelled in an amendment. Thus, Claims 1-11 and 15-17 are pending in the instant Office action.

Election

2. Applicant's election with traverse of Group I in a paper received on March 1, 2004 is acknowledged. The traversal is on the ground(s) that the Examiner failed to explain why Groups I and II lack a common special technical feature. This is not found persuasive for the following reasons. As noted in 37 C.F.R. § 1.475:

> (a) An international and a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention "). Where a group of inventions is claimed in an application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features " shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.
> (b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:
> (1) A product and a process specially adapted for the manufacture of said product; or
> (2) **A product and a process of use of said product**; or
> (3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or
> (4) A process and an apparatus or means specifically designed for carrying out the said process; or
> (5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

> (c) If an application contains claims to more or less than one of the combinations of categories of invention set forth in paragraph (b) of this section, unity of invention might not be present.
> **(d) If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and § 1.476(c).**
> (e) The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim. (emphasis added)

Thus, as noted by the Examiner, wherein multiple uses are claimed relating to the special technical feature, the first mentioned use is grouped with the main invention as set forth in the previous Office action.

The requirement is still deemed proper and is therefore made FINAL.

Priority

3. The instant application is granted the benefit of priority for the U.S. Provisional Application No. 60/153,293 filed on September 10, 1997 and International Application No. PCT/US00/24437 filed on September 6, 2000 as requested in the first lines of the specification.

Information Disclosure Statement

4. Despite relevant references being made of record in the related international application, no information disclosure statement has been filed with the instant application as of the date mailed of the instant Office action. Applicants are reminded that they have a duty to disclose all information, of which they are aware, relevant to the patentability of the pending claims (see 37 C.F.R. § 1.56 and M.P.E.P. § 2000).

Sequence Compliance

5. By virtue of the sequence listing filed on February 11, 2003 containing 4 SEQ ID NOs in computer readable form and paper copy, the instant application now fully complies with the sequence rules.

Objections to the Specification

6. In the specification, the Abstract is objected to for not completely describing the disclosed subject matter (see M.P.E.P. § 608.01(b)). It is noted that in many databases and in foreign countries, the Abstract is crucial in defining the disclosed subject matter, thus, its completeness is essential. The Examiner suggests the inclusion of the full name of the murF enzyme for completeness. Correction is required.

7. The specification is objected to for not clearly describing the drawings. Figures 1A-1C are disclosed but only Figures 1A-1B are described. Correction is required.

8. The specification is objected to for being inconsistent in the description of SEQ ID NO:2. On page 6, line 26, SEQ ID NO:2 is described as having 459 amino acids but the sequence listing filed on February 11, 2003 describes SEQ ID NO:2 as having 458 amino acids. Clarification is required.

9. The specification is objected to for being incomplete. On page 15, 20, and 21, blanks are found. Completion of the text of the specification and/or deletion of the blanks is required.

10. The specification is objected to for being confusing as to the experimental protocol. On page 20 in Example 2, the procedure for cloning of the murF gene from *P. aeruginosa* is unclear,

particularly in the absence of any hybridizing, related murF sequence (such as murF from another source species). As the Example is described, chromosomal DNA is extracted, and murF is cloned with primers for the 5' and 3' ends of murF. How were these primers obtained if murF had not been cloned yet? Were generic murF primers used? Clarification is required.

Claim Objections

11. Claim 4 is objected to for depending from a rejected claim.

12. Claim 5 is objected to for arduous language. The Examiner suggests deleting "The polynucleotide that is" for clarity.

13. Claim 7 is objected to for a misplaced comma after "and" in step (a).

Claim Rejections - 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 1-3 and 5-7 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In Claim 1, the definition of "stringent" hybridization conditions is unclear. Descriptions of various conditions related to "high stringency" are mentioned in the specification on page 11. Firstly, no description of "stringent" conditions is found. Second, such a description in the specification would have to be intended to limit the invention as opposed to the description on page 11 (see line 3). Clarification of the term is required.

15. Claim 7 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is drawn to expressing a *P. aeruginosa* murF protein; however, the dependence on Claim 1 renders this preamble unclear as a limitation or not since Claim 1 is not limited to only *P. aeruginosa* murF genes but any gene hybridizing to a sequence encoding SEQ ID NO:2. Clarification on the metes and bounds is required.

16. Claim 8 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "having **an** amino acid sequence of SEQ ID NO:2" (emphasis added) is unclear because SEQ ID NO:2 is a single sequence and the article "an" indicates a genus of sequences. The Examiner suggests ---having the amino acid sequence...--- for clarity.

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

17. Claims 1-3 and 5-7 are rejected under 35 U.S.C. § 112, first paragraph, written description, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 is drawn to a polynucleotide that hybridizes to a sequence encoding SEQ ID NO:2 without any functional limitation.

The Court of Appeals for the Federal Circuit has recently held that a "written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as be structure, formula [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 1997 U.S. App. LEXIS 18221, at *23, quoting Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) (bracketed material in original). To fully describe a genus of genetic material, which is a chemical compound, applicants must (1) fully describe at least one species of the claimed genus sufficient to represent said genus whereby a skilled artisan, in view of the prior art, could predict the structure of other species encompassed by the claimed genus and (2) identify the common characteristics of the claimed molecules, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these.

The instant specification discloses polynucleotides encoding polypeptides related to SEQ ID NO:2. Applicants have fully described the genus relating to said SEQ ID NOs with both sequence identity limitations and functional limitations (i.e., having murF function, see page 2 lines 14-15). However, the genus of the instant claims also contains polynucleotides within the sequence identity limitations, but having different function. Applicants have not fully described a genus that has sequence identity limitations in the absence of functional limitations.
The Examiner suggests the insertion of a functional limitation on the polynucleotides in the genus of Claim 1.

18. Claims 1-3 and 5-7 are rejected under 35 U.S.C. § 112, first paragraph, scope of enablement, because the specification, while being enabling for polynucleotides encoding SEQ

ID NO:2, does not reasonably provide enablement for polynucleotides having a loose structural relationship to a polynucleotide encoding SEQ ID NO:2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. To make or use the full scope of the invention would require undue experimentation.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The Court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. While all of these factors are considered, a sufficient amount for a *prima facie* case is discussed below.

The instant specification teaches SEQ ID NO:2, a murF protein that is a ligase from *P. aeruginosa*, and SEQ ID NO:1, a *P. aeruginosa* gene exactly encoding SEQ ID NO:2. The art

includes few examples of murF encoding genes. The art fully enables any DNA encoding SEQ ID NO:2 based on the degeneracy of the genetic code and the description of how to use said DNA in the specification. While the instant specification describes and enables means for identifying other murF genes using hybridization methods, etc., these methods do not enable one of skill in the art to make all, or a relevant portion of, the polynucleotides within the scope of the claims because the ability to find a murF gene, which is structurally related to SEQ ID NO:1, is not equivalent to the ability to make a murF gene as required by the statute (i.e., "make and use"). Moreover, the variability of the instant claims without any limitation on the function gives one of skill in the art little information for using all members of the claimed scope. No description in the specification or the art provides particular residues whose encoding is important within the disclosed sequence so that its murF-nature is maintained. Thus, one of skill in the art would be unable to predict the structure of the other members of the genus in order to make such members. Therefore, the instant claims are not enabled to the full extent of their scope.

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

19. Claims 1-3 and 5-7 are rejected under 35 U.S.C. § 102(e) as being anticipated by Rubenfield *et al.* The instant claims are drawn to polynucleotides that will hybridize to a

sequence encoding SEQ ID NO:2, expression vectors, host cells, and methods of making the protein.

Rubenfield *et al.* teach SEQ ID NO:7701 that encodes a protein that is almost identical to SEQ ID NO:2, having only 2 mismatches (see attached alignment). Rubenfield *et al.* also teach related products and methods (see columns 7-8).

Conclusion

20. Claim 4 is objected to. Claims 1-3 and 5-8 are rejected. No claims are allowed for the reasons identified in the numbered sections of this Office action. Applicants must respond to the objections/rejections in each of the numbered sections in this Office action to be fully responsive in prosecution.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen M Kerr whose telephone number is (571) 272-0931. The examiner can normally be reached on Monday through Friday, from 9:00am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathupura Achutamurthy can be reached on (571) 272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kathleen M Kerr
Examiner
Art Unit 1652

May 13, 2004